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Enhanced Detection of Sporadic *Escherichia coli* O157:H7 Infections — New Jersey, July 1994

Infection with *Escherichia coli* O157:H7 causes an estimated 20,000 cases of diarrhea in the United States each year. Although *E. coli* O157:H7 can be isolated using commercially available media, many clinical laboratories do not routinely test stool samples for the organism. In 1993, the Council of State and Territorial Epidemiologists recommended that clinical laboratories begin culturing all bloody stools—and optimally all diarrheal stools—for *E. coli* O157:H7 (*1*). This report describes the investigation of a pseudo-outbreak of *E. coli* O157:H7 infection that occurred in New Jersey during July 1994 after a year-long increase in the number of laboratories culturing all diarrheal specimens for this pathogen.

From June 1 through July 27, 1994, a total of 46 culture-confirmed cases of *E. coli* O157:H7 infection were reported to the New Jersey Department of Health (NJDOH). In comparison, five cases had been reported during the same period in 1993. To identify the source of these infections, NJDOH and CDC conducted a case-control study involving 23 cases and 46 age-matched controls. A case was defined as a stool culture positive for *E. coli* O157:H7 in a New Jersey resident with onset of diarrhea during July 1994. Of 22 case-patients for whom data were available, 18 (81%) reported they had eaten a hamburger during the week before illness, compared with 21 (47%) of 45 matched controls for whom data were available (matched odds ratio=undefined, $p<0.001$). Of the hamburgers eaten by case-patients, 73% had been prepared at home or at picnics. No other food item or activity was associated with illness.

An extensive traceback investigation was conducted to identify the source of ground beef eaten by ill persons. The investigation identified multiple retail and wholesale sources, suggesting these cases were sporadic and not related to a common-source outbreak. This finding was verified by laboratory tests that identified 17 different strains of *E. coli* O157:H7 among the 23 clinical isolates. To assess the role of enhanced laboratory surveillance in generating the increase in case reports, NJDOH surveyed 20 clinical laboratories that had reported at least one *E. coli* O157:H7 isolate during 1994. The number of laboratories culturing all diarrheal specimens for *E. coli* O157:H7 had increased from two (10%) in July 1993 to 18 (90%) in July 1994.

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E. coli *Detection — Continued*

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Editorial Note: Since 1993, several outbreaks of *E. coli* O157:H7 infection have been detected as a result of increased laboratory testing for this organism (*2,3*). The findings in New Jersey demonstrate that increased testing can also substantially enhance detection and reporting of sporadic infections. In January 1995, an estimated 29% of clinical laboratories in the United States were culturing all diarrheal specimens for *E. coli* O157:H7; however, the proportion was increasing rapidly (CDC, unpublished data, 1995). Therefore, public health officials should anticipate continuing increases in reports of both sporadic and outbreak-related cases and should evaluate the role of enhanced detection when an outbreak is suspected.

A primary strategy for preventing infection with *E. coli* O157:H7 is reducing risk behaviors through consumer education. In New Jersey, the sudden increase in *E. coli* O157:H7 case reports was reported widely by the news media. The press coverage provided public health officials with an opportunity to inform the public about the risks of eating undercooked ground beef, the need for safe food-handling practices, and the potential for person-to-person transmission.

Although traceback investigations can be important in preventing *E. coli* O157:H7 infections, they should be undertaken selectively. Traceback investigations are most useful when the implicated vehicle is novel (e.g., salami) (*3*) or has a long shelf life (e.g., frozen hamburger patties) (*4*). Because fresh ground beef has a short shelf life and usually is derived from many sources, traceback investigations involving this food item are often unproductive.

An effective public health response to *E. coli* O157:H7 requires a timely and sensitive national surveillance system. Through March 1995, a total of 33 states had enacted legislation designating *E. coli* O157:H7 infection as a reportable disease (W. Keene, State Health Division, Oregon Department of Human Resources, personal communication, 1995). In addition, CDC has developed a software module that enables states to report laboratory-confirmed cases to CDC through the Public Health Laboratory Information System (PHLIS). During January 1994–March 1995, a total of 38 states reported to PHLIS 1187 isolates of *E. coli* that were positive for both the O157 and H7 antigens. Although PHLIS is a passive, laboratory-based system, reported incidence rates in some states have exceeded three cases per 100,000 population. With expanded culturing by clinical laboratories and strengthened reporting by states, these rates probably will increase.

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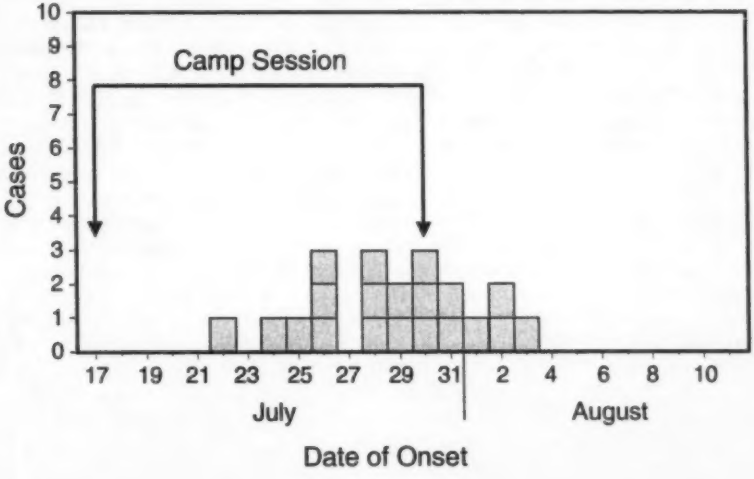
Escherichia coli O157:H7 Outbreak at a Summer Camp — Virginia, 1994

On August 8, 1994, the Virginia Department of Health was notified that several campers and counselors at a summer camp had developed bloody diarrhea. The outbreak began during the July 17–30 session at a rural camp where activities included frequent overnight trips at which meals were cooked over a campfire. This report summarizes the findings from the investigation, which confirmed *E. coli* O157:H7 as the causative agent.

To determine the source and extent of the outbreak, a standardized questionnaire was administered in person, by telephone, or sent by mail to all campers (aged 7–17 years) and counselors (aged 16–25 years) who attended the session; when necessary, parents assisted younger campers in responding to the questionnaire. A case-patient was defined as a camper or counselor either with a history of bloody diarrhea or with nonbloody diarrhea (three or more loose stools in a 24-hour period) and abdominal cramps with onset during July 17–August 7.

A total of 156 (76%) of the 205 campers and counselors from this session were contacted. Attack rates for illness were 13% (18 of 135) among campers and 10% (two of 21) among counselors. The median age of case-patients was 12 years (range: 9–22 years). Onset of illness occurred from July 22 through August 3 (Figure 1). The median duration of illness was 6 days (range: 3–10 days). Seven patients had grossly bloody diarrhea, and three were hospitalized, including one with hemolytic uremic syndrome. Of nine patients for whom clinical specimens were submitted to laboratories, evidence of *E. coli* O157:H7 infection was detected in seven (specimens for two were positive by stool culture, and elevated IgM antibody titers to *E. coli* O157 lipopolysaccharide antigen were present in serum samples of five).

FIGURE 1. Cases of diarrhea at a summer camp, by date of onset — Virginia, July 22–August 3, 1994



E. coli *Outbreak — Continued*

Consumption of rare (red or pink) ground beef during the camp session was associated with a substantially increased risk for illness (attack rates: 53% [eight of 15] versus 9% [12 of 141]; relative risk 6.3; 95% confidence interval 3.1–12.9). Increased risk for illness was not associated with consumption of other foods and beverages at camp (including well-cooked ground beef), handling uncooked ground beef, contact with ill campers, sharing water bottles, or swimming frequency.

Of the 15 persons who reported eating rare ground beef while at camp, 13 ate the rare ground beef at meals cooked over a campfire on an overnight trip. Rare ground beef was reported to have been eaten at seven different meals cooked over a campfire. No other risk factors for illness were identified in case-patients who did not report eating rare ground beef.

Cultures of specimens of ground beef from one of six lots used during the camp session and of drinking water and swimming water at the camp were negative for *E. coli* O157:H7. A traceback conducted by the Virginia Department of Agriculture and Consumer Services identified one package of ground beef from a lot distributed to another site; cultures of specimens from this package also were negative for *E. coli* O157:H7.

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Editorial Note: *E. coli* O157:H7 is increasingly reported as a cause of both sporadic and outbreak-associated gastroenteritis in the United States. The increase in reported cases is believed to reflect both a true increase in incidence and improved laboratory testing and reporting (*1*). The spectrum of *E. coli* O157:H7 infection includes asymptomatic infection, nonbloody or bloody diarrhea, and hemolytic uremic syndrome, which occurs in approximately 6% of cases and is a leading cause of acute renal failure among U.S. children. Clinicians considering a diagnosis of *E. coli* O157:H7 gastroenteritis should determine whether a specific request for culture of *E. coli* O157:H7 is required by their laboratory because the range of enteric pathogens included in "routine" stool cultures varies widely by laboratory. For example, of 78 hospital laboratories in Virginia that were surveyed during September 1994, only 14 (18%) reported screening for *E. coli* O157:H7 as part of their routine procedure (*2*).

Outbreaks of *E. coli* O157:H7 have been associated with an expanding range of foods (*3,4*), beverages (*5*), and activities (*6*) and with person-to-person transmission (*7*). Consumption of undercooked ground beef accounts for the greatest number of foodborne-related *E. coli* O157:H7 infections (*1*) and was epidemiologically implicated as the cause of the outbreak described in this report. Thorough cooking is the most effective measure to prevent *E. coli* O157:H7 infection associated with consumption of ground beef. Adequate cooking requires that the core temperature of the meat reach 155 F (68 C) for at least 15 seconds, and can be qualitatively assessed by ensuring that the meat is gray or brown throughout and juices are clear (*8*).

E. coli *Outbreak — Continued*

In 1994, CDC received reports of three *E. coli* O157:H7 outbreaks at U.S. summer camps. Prevention of such outbreaks requires that campers and counselors who cook over campfires be informed about the importance of determining that ground beef has been adequately cooked. Kitchen staff who have been trained also can assist campers and counselors with food preparation; summer camps that serve ground beef should consider purchasing fully precooked ground beef. The importance of proper foodhandling practices at dining halls and campsites should be emphasized during routine summer camp inspections conducted by health departments, and instructions regarding the handling and cooking of ground beef should be included in scouting and camping manuals.

References

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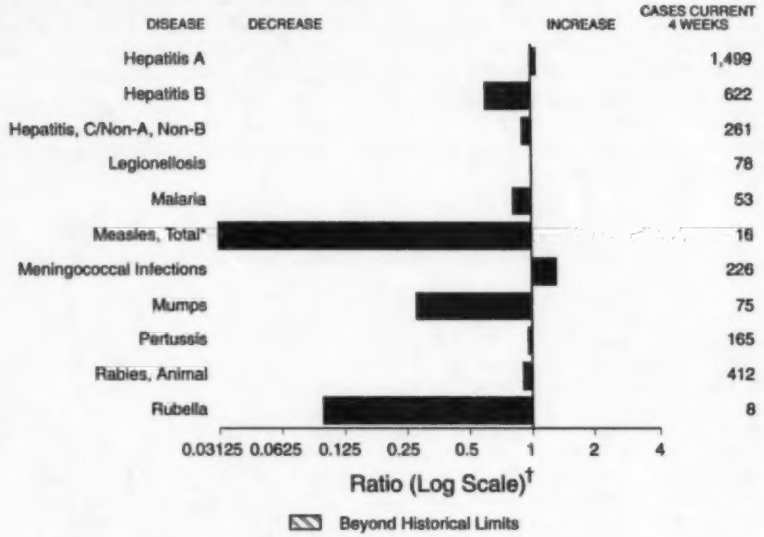
Estimated Expenditures for Core Public Health Functions — Selected States, October 1992–September 1993

Core public health functions (i.e., essential public health services) are activities that public health departments and other partners undertake to protect and ensure the health of the public. Although total spending for public health programs in the United States has been estimated (*1*), expenditures for core public health functions have not been characterized. To characterize such expenditures, the Public Health Service (PHS) and the Public Health Foundation (PHF) surveyed senior public health officials in eight states (Connecticut, Illinois, Iowa, Missouri, New York, Oregon, Rhode Island, and Texas [combined 1990 population: 61.4 million]) and used the survey data to estimate national expenditures for core functions during fiscal year 1993 (October 1992–September 1993). This report summarizes the results of that survey (*2*).

The eight states were selected to reflect geographic and population diversity, and the scope of public health responsibilities of the health agencies in these states varied substantially. Senior public health officials in each state used standard forms and methodologies developed by PHS and PHF to provide state-specific total expenditures

(Continued on page 427)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending June 3, 1995, with historical data — United States



*The large apparent decrease in the number of reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

†Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending June 3, 1995 (22nd Week)

	Cum. 1995		Cum. 1995
Anthrax	-	Psittacosis	25
Brucellosis	31	Rabies, human	1
Cholera	7	Rocky Mountain Spotted Fever	70
Congenital rubella syndrome	3	Syphilis, congenital, age < 1 year†	-
Diphtheria	1	Tetanus	9
*Haemophilus influenzae**	557	Toxic shock syndrome	92
Hansen Disease	55	Trichinosis	19
Plague	2	Typhoid fever	127
Poliomyelitis, Paralytic	-		

*Of 544 cases of known age, 134 (25%) were reported among children less than 5 years of age.

†Updated quarterly from reports to the Division of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Services. First quarter data not yet available.

-: no reported cases

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 3, 1995, and June 4, 1994 (22nd Week)

Reporting Area	AIDS*	Gonorrhea		Hepatitis (Viral), by type						Legionellosis	
				A		B		C/NA,NB			
	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	29,887	147,067	155,062	10,350	9,282	3,978	4,921	1,816	1,809	545	621
NEW ENGLAND	1,471	2,047	3,343	97	132	82	174	47	83	10	10
Maine	28	32	42	14	12	6	7	-	-	3	-
N.H.	49	45	31	4	5	11	15	4	5	-	-
Vt.	14	18	11	3	2	1	5	-	6	-	-
Mass.	652	1,167	1,219	41	60	30	110	42	41	6	5
R.I.	122	221	195	11	12	8	3	1	11	1	5
Conn.	606	564	1,845	24	41	26	34	-	-	N	N
MID. ATLANTIC	7,605	15,432	17,482	584	842	490	625	148	220	62	75
Upstate N.Y.	836	2,612	4,287	161	214	152	162	74	94	19	18
N.Y. City	3,952	5,501	6,606	260	219	124	137	1	1	-	-
N.J.	1,794	1,703	2,323	90	138	127	166	62	104	14	14
Pa.	1,023	5,616	4,264	73	71	77	160	11	21	29	43
E.N. CENTRAL	2,492	31,548	32,721	1,339	875	411	504	114	160	150	218
Ohio	544	10,506	9,765	838	276	51	83	5	9	78	76
Ind.	200	2,714	3,389	58	142	89	91	-	4	33	73
Ill.	1,105	8,485	9,764	200	258	81	140	24	43	11	17
Mich.	502	7,715	6,854	168	111	171	153	85	104	15	34
Wis.	141	2,128	2,949	77	88	19	37	-	-	13	18
W.N. CENTRAL	697	7,870	8,764	622	444	223	274	44	33	53	41
Minn.	148	1,230	1,402	66	83	21	28	2	6	-	-
Iowa	40	599	553	36	22	16	15	3	7	12	21
Mo.	280	4,761	4,541	422	194	148	202	25	6	29	10
N. Dak.	2	13	17	14	1	3	-	3	-	3	4
S. Dak.	7	78	80	15	15	1	-	1	-	-	-
Nebr.	61	-	558	23	70	16	14	5	5	7	4
Kans.	159	1,189	1,613	46	59	18	15	5	9	2	2
S. ATLANTIC	7,773	43,579	42,124	477	460	539	972	137	248	83	153
Del.	154	862	762	7	14	2	7	1	1	-	-
Md.	1,133	5,178	7,961	83	73	88	157	4	13	17	35
D.C.	484	1,996	2,734	3	10	10	16	-	-	3	4
Va.	552	4,411	5,217	84	59	38	54	5	17	5	3
W. Va.	36	224	304	11	5	29	10	23	15	3	1
N.C.	405	10,229	10,313	55	47	120	125	27	27	15	10
S.C.	398	4,954	5,156	16	12	21	17	7	3	16	8
Ga.	935	7,142	U	43	22	50	411	11	148	10	70
Fla.	3,696	8,583	9,677	175	218	181	175	59	24	14	22
E.S. CENTRAL	961	18,568	14,050	518	181	415	493	549	357	15	37
Ky.	116	1,915	1,870	22	90	32	46	8	12	2	5
Tenn.	380	5,543	5,599	416	65	329	412	539	337	9	25
Ala.	263	7,693	6,581	51	26	54	35	2	8	3	7
Miss.	202	3,415	U	29	U	-	U	-	U	1	U
W.S. CENTRAL	2,513	13,730	17,787	1,198	1,175	564	517	251	164	5	14
Ark.	108	1,602	2,814	108	23	20	9	2	3	-	4
La.	368	4,972	5,069	42	66	76	76	59	47	2	-
Okla.	131	950	1,719	231	106	175	132	176	87	2	8
Tex.	1,908	6,206	8,185	817	980	293	300	14	27	1	2
MOUNTAIN	975	3,243	4,037	1,793	1,807	351	263	204	190	101	41
Mont.	8	38	38	26	11	9	9	8	2	4	13
Idaho	24	54	33	178	148	39	42	25	46	1	-
Wyo.	5	21	35	69	10	8	8	80	56	3	2
Colo.	339	1,242	1,395	227	207	55	45	32	29	28	7
N. Mex.	81	361	435	356	472	135	89	26	32	3	1
Ariz.	288	1,232	1,269	510	675	56	27	20	8	44	1
Utah	58	83	145	371	170	34	18	5	9	5	3
Nev.	192	212	697	56	114	15	25	8	8	13	14
PACIFIC	5,400	11,054	14,754	3,722	3,566	913	1,099	322	374	66	32
Wash.	463	1,053	1,245	247	500	72	103	85	118	5	7
Oreg.	184	202	354	686	362	38	64	22	16	-	-
Calif.	4,587	9,232	12,485	2,694	2,585	789	905	205	236	56	23
Alaska	45	329	358	16	94	5	7	1	-	-	-
Hawaii	121	238	312	79	25	9	20	9	4	5	2
Guam	-	31	111	2	16	-	3	-	-	-	3
P.R.	1,099	233	220	41	27	314	134	190	57	-	-
V.I.	19	4	10	-	1	2	4	-	-	-	-
Amer. Samoa	-	8	14	5	4	-	-	-	-	-	-
C.N.M.I.	-	12	40	15	5	7	-	-	-	-	-

N: Not notifiable U: Unavailable -: no reported cases C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly to the Division of HIV/AIDS Prevention, National Center for Prevention Services, last update May 25, 1995.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 3, 1995, and June 4, 1994 (22nd Week)

Reporting Area	Lyme Disease		Malaria		Measles (Rubeola)						Meningococcal Infections		Mumps	
					Indigenous		Imported*		Total					
	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	1995	Cum. 1995	1995	Cum. 1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	1,735	2,114	377	391	9	167	-	8	175	688	1,473	1,406	379	842
NEW ENGLAND	191	212	18	26	-	4	-	-	4	27	73	60	4	11
Maine	2	-	1	1	-	-	-	-	-	4	5	12	2	3
N.H.	11	8	1	3	-	-	-	-	-	1	15	5	-	4
Vt.	2	2	-	1	-	-	-	-	-	1	6	2	-	-
Mass.	48	33	5	11	-	2	-	-	2	6	24	25	1	-
R.I.	38	24	2	4	-	2	-	-	2	12	-	-	-	1
Conn.	92	145	9	6	-	-	-	-	-	3	23	16	1	3
MID. ATLANTIC	1,277	1,401	87	58	-	1	-	2	3	187	168	142	55	59
Upstate N.Y.	788	1,139	21	17	-	-	-	-	-	14	60	43	14	14
N.Y. City	20	2	34	15	-	1	-	2	3	7	18	21	5	-
N.J.	136	141	22	16	-	-	-	-	-	159	42	33	5	11
Pa.	333	119	10	10	-	-	-	-	-	7	48	45	31	34
E.N. CENTRAL	21	175	38	45	-	6	-	1	7	86	188	195	65	117
Ohio	15	10	2	7	-	1	-	-	1	15	61	53	20	27
Ind.	3	5	2	8	U	-	U	-	-	1	27	24	1	6
Ill.	2	9	23	18	-	-	-	-	-	51	53	69	24	54
Mich.	1	1	9	11	-	3	-	1	4	15	40	26	20	26
Wis.	-	150	2	1	-	2	-	-	2	3	7	23	-	4
W.N. CENTRAL	21	30	9	19	-	1	-	-	1	161	89	95	25	31
Minn.	-	-	3	5	-	-	-	-	-	-	16	9	2	3
Iowa	1	1	1	4	-	-	-	-	-	-	16	12	8	8
Mo.	4	26	3	7	-	1	-	-	1	159	33	42	11	16
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	1	-	1
S. Dak.	-	-	-	-	-	-	-	-	-	-	4	6	-	-
Nebr.	1	-	2	2	-	-	-	-	-	1	9	8	4	1
Kans.	15	3	-	1	-	-	-	-	-	1	11	17	-	-
S. ATLANTIC	152	211	86	81	-	1	-	-	1	11	252	216	44	101
Del.	7	27	1	3	-	-	-	-	-	-	3	2	-	-
Md.	98	89	21	36	-	-	-	-	-	2	14	12	-	25
D.C.	-	1	8	7	-	-	-	-	-	-	1	2	-	-
Va.	12	22	15	9	-	-	-	-	-	2	30	38	13	24
W. Va.	12	5	1	-	-	-	-	-	-	-	4	9	-	3
N.C.	11	28	6	2	-	-	-	-	-	-	45	35	16	24
S.C.	5	2	-	2	-	-	-	-	-	-	32	11	6	6
Ga.	5	55	11	10	-	-	-	-	-	2	58	49	-	7
Fla.	2	4	23	12	-	1	-	-	1	5	65	58	9	12
E.S. CENTRAL	10	15	8	10	-	-	-	-	-	28	88	88	14	4
Ky.	1	10	-	4	-	-	-	-	-	-	25	22	-	-
Tenn.	6	4	3	4	-	-	-	-	-	28	24	22	4	3
Ala.	1	1	5	2	-	-	-	-	-	-	24	44	4	1
Miss.	2	U	-	U	-	-	-	-	-	U	15	U	6	U
W.S. CENTRAL	34	35	9	14	9	11	-	-	11	12	189	188	23	148
Ark.	2	1	2	-	-	2	-	-	2	1	19	27	2	4
La.	1	-	1	2	9	9	-	-	9	1	28	23	7	15
Okla.	13	19	-	2	-	-	-	-	-	-	19	18	-	21
Tex.	18	15	6	10	-	-	-	-	-	10	123	100	14	108
MOUNTAIN	3	1	25	18	-	42	-	1	43	134	118	105	19	45
Mont.	-	-	2	-	-	-	-	-	-	-	2	2	1	-
Idaho	-	1	1	2	-	-	-	-	-	-	5	13	2	4
Wyo.	1	-	-	-	-	-	-	-	-	-	5	5	-	1
Colo.	1	-	14	8	-	3	-	-	3	18	25	18	1	1
N. Mex.	-	-	3	2	-	28	-	-	28	-	26	11	N	N
Ariz.	-	-	2	1	-	10	-	-	10	-	42	40	5	25
Utah	-	-	2	4	-	-	-	1	1	107	6	14	3	7
Nev.	1	-	1	1	-	1	-	-	1	9	7	4	6	6
PACIFIC	26	34	97	120	-	101	-	4	105	43	308	337	130	128
Wash.	1	-	10	11	-	13	-	2	15	-	54	50	10	7
Oreg.	2	2	4	10	-	1	-	-	1	-	51	75	N	N
Calif.	23	32	75	91	-	87	-	1	88	41	195	206	107	111
Alaska	-	-	1	-	-	-	-	-	-	-	6	2	9	2
Hawaii	-	-	7	8	-	-	-	1	1	2	2	4	4	8
Guam	-	-	-	-	U	-	U	-	-	401	2	-	3	5
P.R.	-	-	-	-	2	9	-	-	9	11	12	5	-	2
V.I.	-	-	-	-	U	-	U	-	-	-	-	-	2	2
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	1
C.N.M.I.	-	-	-	2	-	-	-	-	-	52	-	-	-	1

*For imported measles, cases include only those resulting from importation from other countries.
N: Not notifiable U: Unavailable -: no reported cases

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 3, 1995, and June 4, 1994 (22nd Week)

Reporting Area	Pertussis			Rubella			Syphilis (Primary & Secondary)		Tuberculosis		Rabies, Animal	
	1995	Cum. 1995	Cum. 1994	1995	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994	Cum. 1995	Cum. 1994
UNITED STATES	39	1,248	1,482	4	40	158	6,492	8,388	6,948	8,090	2,672	2,986
NEW ENGLAND	6	156	171	-	6	111	83	92	136	161	724	796
Maine	-	18	2	-	-	-	2	4	-	-	-	-
N.H.	-	13	39	-	1	-	1	1	5	6	87	92
Vt.	-	3	27	-	-	-	-	-	1	2	101	68
Mass.	6	115	89	-	2	110	32	35	79	79	256	300
R.I.	-	-	3	-	-	1	1	8	18	16	113	5
Conn.	-	7	11	-	3	-	47	44	33	58	167	331
MID. ATLANTIC	6	108	275	-	3	5	389	562	1,474	1,612	632	715
Upstate N.Y.	2	61	99	-	1	5	24	80	165	215	254	490
N.Y. City	-	22	54	-	2	-	208	288	789	984	-	-
N.J.	-	2	9	-	-	-	81	99	285	287	158	136
Pa.	4	23	113	-	-	-	76	95	235	126	220	89
E.N. CENTRAL	5	124	238	-	-	6	1,110	1,318	734	446	10	15
Ohio	4	41	64	-	-	-	396	482	117	114	1	-
Ind.	U	6	33	U	-	-	91	104	21	72	-	2
Ill.	1	27	50	-	-	1	425	455	411	42	2	3
Mich.	-	38	22	-	-	5	130	144	161	194	6	5
Wis.	-	12	69	-	-	-	68	133	24	24	1	5
W.N. CENTRAL	1	62	57	-	-	1	333	535	245	210	128	79
Minn.	-	28	27	-	-	-	18	22	53	43	4	8
Iowa	1	2	5	-	-	-	28	21	33	15	46	31
Mo.	-	5	13	-	-	1	278	456	95	105	15	9
N. Dak.	-	6	3	-	-	-	-	1	1	3	15	4
S. Dak.	-	7	-	-	-	-	-	-	10	9	22	11
Nebr.	-	3	3	-	-	-	-	5	9	7	-	-
Kans.	-	11	6	-	-	-	9	30	44	28	26	16
S. ATLANTIC	1	107	160	4	9	9	1,544	2,323	1,253	1,684	899	785
Del.	-	5	-	-	-	-	7	12	-	13	33	16
Md.	-	10	52	-	-	-	24	96	189	137	176	240
D.C.	-	2	3	-	-	-	56	109	43	47	7	2
Va.	1	8	15	-	-	-	282	304	61	157	169	170
W. Va.	-	-	2	-	-	-	1	8	44	39	41	33
N.C.	-	50	44	-	-	-	506	763	121	210	178	84
S.C.	-	11	9	-	-	-	291	299	133	181	54	78
Ga.	-	1	11	-	-	-	210	369	240	318	127	159
Fla.	-	20	24	4	9	9	167	363	422	582	104	3
E.S. CENTRAL	-	24	76	-	-	-	1,801	821	445	477	79	87
Ky.	-	-	52	-	-	-	89	96	53	135	8	5
Tenn.	-	4	13	-	-	-	350	417	162	171	11	34
Ala.	-	20	11	-	-	-	269	308	165	171	60	48
Miss.	-	-	U	-	-	U	1,093	U	65	U	-	U
W.S. CENTRAL	3	61	38	-	2	7	926	2,127	774	945	38	329
Ark.	-	-	6	-	-	-	181	223	75	86	11	14
La.	1	4	5	-	-	-	457	804	-	7	9	41
Okla.	-	13	20	-	-	4	31	71	7	106	18	16
Tex.	2	44	7	-	2	3	257	1,029	692	746	-	258
MOUNTAIN	9	423	162	-	4	3	103	141	258	203	53	53
Mont.	-	3	3	-	-	-	3	1	3	9	19	7
Idaho	-	72	23	-	-	-	-	1	8	6	-	-
Wyo.	-	-	-	-	-	-	2	-	1	1	16	10
Colo.	3	6	89	-	-	-	65	73	4	20	-	-
N. Mex.	5	29	8	-	-	-	7	6	40	27	3	1
Ariz.	-	298	27	-	3	-	16	32	126	88	13	33
Utah	-	10	10	-	1	2	3	7	10	-	1	-
Nev.	1	5	2	-	-	1	7	21	68	52	1	2
PACIFIC	8	183	305	-	16	16	203	489	1,629	2,352	119	127
Wash.	3	33	37	-	1	-	7	20	110	104	-	-
Oreg.	-	7	41	-	1	-	6	16	23	48	-	-
Calif.	5	127	222	-	13	15	189	430	1,391	2,059	115	96
Alaska	-	-	-	-	-	-	1	2	34	30	4	31
Hawaii	-	16	5	-	1	1	-	1	71	111	-	-
Guam	U	-	1	U	-	1	1	4	4	36	-	-
P.R.	-	8	2	-	-	-	130	144	56	62	18	41
V.I.	U	-	-	U	-	-	1	21	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	1	3	2	-	-
C.N.M.I.	-	-	-	-	-	-	3	-	13	22	-	-

U: Unavailable -: no reported cases

TABLE III. Deaths in 121 U.S. cities,* week ending June 3, 1995 (22nd Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	587	423	88	50	14	12	31
Boston, Mass.	177	123	31	14	4	5	3
Bridgeport, Conn.	37	25	8	3	1	-	2
Cambridge, Mass.	35	28	-	4	2	1	4
Fall River, Mass.	25	21	4	-	-	-	1
Hartford, Conn.	46	34	5	5	1	1	1
Lowell, Mass.	28	21	5	1	-	1	1
Lynn, Mass.	16	13	2	1	-	-	-
New Bedford, Mass.	18	12	2	4	-	-	2
New Haven, Conn.	29	13	6	6	2	2	1
Providence, R.I.	44	31	6	4	1	2	2
Somerville, Mass.	5	5	-	-	-	-	1
Springfield, Mass.	35	28	5	2	-	-	1
Waterbury, Conn.	25	18	3	2	2	-	1
Worcester, Mass.	67	51	11	4	1	-	11
MID. ATLANTIC	1,988	1,301	379	238	34	33	72
Albany, N.Y.	55	39	12	2	-	2	6
Allentown, Pa.	20	14	4	1	1	-	-
Buffalo, N.Y.	99	76	15	7	-	1	3
Camden, N.J.	30	18	6	4	1	1	1
Elizabeth, N.J.	14	9	4	1	-	-	-
Erie, Pa.§	41	35	5	1	-	-	-
Jersey City, N.J.	47	28	9	8	1	1	1
New York City, N.Y.	1,208	757	242	175	19	15	32
Newark, N.J.	58	23	11	16	4	1	3
Paterson, N.J.	U	U	U	U	U	U	U
Philadelphia, Pa.	U	U	U	U	U	U	U
Pittsburgh, Pa.§	78	54	15	3	-	6	5
Reading, Pa.	14	11	1	2	-	-	1
Rochester, N.Y.	140	100	27	6	4	3	10
Schenectady, N.Y.	25	20	3	2	-	-	1
Scranton, Pa.§	33	28	2	1	2	-	-
Syracuse, N.Y.	66	50	10	4	2	-	7
Trenton, N.J.	38	20	11	4	-	3	2
Utica, N.Y.	22	19	2	1	-	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,020	1,231	378	247	114	50	107
Akron, Ohio	34	25	6	2	1	-	-
Canton, Ohio	38	22	10	2	-	2	2
Chicago, Ill.	542	227	119	112	74	10	27
Cincinnati, Ohio	94	61	16	7	3	7	7
Cleveland, Ohio	169	89	20	14	2	4	2
Columbus, Ohio	144	93	30	12	6	3	11
Dayton, Ohio	108	83	12	7	3	3	5
Detroit, Mich.	210	125	42	27	8	8	5
Evansville, Ind.	44	32	3	5	3	1	-
Fort Wayne, Ind.	37	25	7	3	2	-	-
Gary, Ind.	12	7	2	3	-	-	1
Grand Rapids, Mich.	46	35	6	3	2	-	4
Indianapolis, Ind.	182	116	35	22	5	4	14
Madison, Wis.	55	38	11	3	2	1	4
Milwaukee, Wis.	102	71	23	6	1	1	10
Peoria, Ill.	39	25	9	3	-	2	4
Rockford, Ill.	47	38	5	3	-	1	4
South Bend, Ind.	47	33	8	5	-	1	-
Toledo, Ohio	77	61	8	5	1	2	5
Youngstown, Ohio	55	45	6	3	1	-	2
W.N. CENTRAL	576	392	98	37	16	18	36
Des Moines, Iowa	57	44	6	5	-	2	9
Duluth, Minn.	20	15	4	-	1	-	1
Kansas City, Kans.	U	U	U	U	U	U	U
Kansas City, Mo.	120	68	28	7	-	4	8
Lincoln, Nebr.	18	12	3	1	-	2	1
Minneapolis, Minn.	123	89	19	6	4	5	9
Omaha, Nebr.	71	48	14	5	4	-	2
St. Louis, Mo.	115	82	15	6	7	5	5
St. Paul, Minn.	52	34	11	7	-	-	3
Wichita, Kans.	U	U	U	U	U	U	U
S. ATLANTIC	1,275	786	267	142	52	28	70
Atlanta, Ga.	137	83	33	16	2	3	1
Baltimore, Md.	264	153	56	37	11	7	23
Charlotte, N.C.	78	59	11	6	-	-	8
Jacksonville, Fla.	121	84	22	8	6	1	6
Miami, Fla.	126	74	32	11	8	1	1
Norfolk, Va.	62	33	15	3	7	4	3
Richmond, Va.	66	35	19	9	1	2	2
Savannah, Ga.	51	39	6	4	2	-	9
St. Petersburg, Fla.	56	48	6	3	1	-	2
Tampa, Fla.	130	88	24	12	3	3	12
Washington, D.C.	174	85	43	33	6	7	3
Wilmington, Del.	12	7	-	-	5	-	-
E.S. CENTRAL	642	427	127	52	9	26	57
Birmingham, Ala.	99	68	18	7	3	2	6
Chattanooga, Tenn.	50	34	9	6	-	1	4
Knoxville, Tenn.	66	49	15	2	-	-	8
Lexington, Ky.	40	30	6	3	1	-	4
Memphis, Tenn.	222	142	41	19	4	16	19
Mobile, Ala.	44	28	7	4	-	5	6
Montgomery, Ala.	39	23	13	2	1	-	3
Nashville, Tenn.	82	53	18	9	-	2	7
W.S. CENTRAL	1,093	715	204	117	35	21	74
Austin, Tex.	64	37	15	5	5	2	8
Baton Rouge, La.	26	17	6	3	-	-	1
Corpus Christi, Tex.	43	30	6	7	-	-	2
Dallas, Tex.	156	86	37	22	9	2	5
El Paso, Tex.	68	50	9	3	3	2	9
Ft. Worth, Tex.	89	63	16	7	1	2	2
Houston, Tex.	282	162	59	43	9	9	22
Little Rock, Ark.	67	49	11	5	1	1	2
New Orleans, La.	U	U	U	U	U	U	U
San Antonio, Tex.	157	109	27	16	3	2	9
Shreveport, La.	56	45	8	2	1	-	7
Tulsa, Okla.	85	67	10	4	3	1	7
MOUNTAIN	745	496	120	78	29	21	47
Albuquerque, N.M.	74	51	11	9	3	-	6
Colo. Springs, Colo.	42	32	9	-	-	1	4
Denver, Colo.	104	67	12	16	6	3	5
Las Vegas, Nev.	121	74	20	21	4	2	11
Ogden, Utah	27	21	2	3	1	-	1
Phoenix, Ariz.	158	96	29	16	7	9	4
Pueblo, Colo.	31	18	8	4	1	-	1
Salt Lake City, Utah	83	63	13	3	2	2	10
Tucson, Ariz.	105	74	16	6	5	4	5
PACIFIC	1,608	1,096	267	161	37	25	139
Berkeley, Calif.	17	11	3	3	-	-	4
Fresno, Calif.	49	33	8	5	2	1	4
Glendale, Calif.	22	16	4	1	-	-	3
Honolulu, Hawaii	71	53	8	8	-	1	13
Long Beach, Calif.	73	50	12	10	-	1	12
Los Angeles, Calif.	414	267	86	36	15	5	22
Pasadena, Calif.	26	19	3	2	2	-	3
Portland, Oreg.	98	69	14	10	2	3	4
Sacramento, Calif.	133	98	21	9	4	3	13
San Diego, Calif.	118	78	18	15	3	6	13
San Francisco, Calif.	134	83	19	15	-	2	13
San Jose, Calif.	161	115	21	19	5	1	15
Santa Cruz, Calif.	45	34	8	3	-	-	5
Seattle, Wash.	104	75	22	5	2	-	2
Spokane, Wash.	58	34	10	12	1	1	4
Tacoma, Wash.	85	65	10	8	1	1	9
TOTAL	10,534¶	6,887	1,928	1,122	340	234	633

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

†Pneumonia and influenza.

§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

¶Total includes unknown ages.

U: Unavailable -: no reported cases

Core Public Health Functions — Continued

and expenditures associated with 10 core public health functions (encompassing surveillance, preventive services, outreach, quality assurance, training, and planning) during fiscal year 1993. Respondents provided the budgets of state and local public health agencies, substance-abuse agencies, mental health agencies, and environmental agencies. State populations were determined from the 1990 census.

Among the eight states, per capita expenditures for core public health functions ranged from $31 to $57 (mean: $44); these expenditures constituted 15%–46% (mean: 27%) of the total expenditures for combined public health agencies in each state. Per capita expenditures for all public health agencies combined in each state ranged from $93 to $275 (mean: $166). Overall, approximately 30% of core public health expenditures were spent by environmental health agencies.

Health expenditures by state and local public health agencies were calculated by excluding substance-abuse, mental health, and environmental health agency expenditures. Per capita expenditures by state and local public health agencies ranged from $42 to $101 (mean: $64); core public health expenditures constituted 30%–61% (mean: 41%) of the total expenditures by state and local public health agencies in each state.

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Editorial Note: The findings in this report indicate that to provide the essential services of public health to communities, an average of $44 per capita was spent during 1993 by the eight states included in the survey. Based on this finding and assuming that these states are representative of the U.S. population, during the same period nationally, state and local public health, substance-abuse, mental health, and environmental agencies spent an estimated $11.4 billion (range: $8.0 billion–$14 billion) on core public health functions.* In addition, during this period, PHS spent an estimated $3.0 billion on core public health functions (*1*). Therefore, during fiscal year 1993, the combined estimated state, local, and PHS expenditures on core public health functions were $14.4 billion (range: $11 billion–$17 billion). Based on an estimate by the Health Care Financing Administration (HCFA), total health-care–related expenditures for the United States in 1993 were $903 billion (*3*). Thus, core public health functions accounted for approximately 1.6% (range: 1.2%–2.0%) of national health-care expenditures in 1993. If expenditures by environmental agencies and PHS are not considered, only 0.9% was spent on core public health functions. In comparison, HCFA estimated that, in 1993, expenditures for federal, state, and local public health activities were $24.2 billion—or 2.7% of national health expenditures. In addition, a previous report indicated that, in 1988, prevention-related activities accounted for 3.4% of national health expenditures (*4*).

The findings in this report are subject to at least two limitations. First, the estimated expenditures are based on the analysis of data from a small, nonrandom sample of

*$11.4 billion=$44.35 (spent per capita) multiplied by 258 million (U.S. 1993 population); the range is based on the range of per capita expenditures for the eight states surveyed.

Core Public Health Functions — Continued

states that may not be representative of all states. In particular, the availability and use of resources for core public health functions may vary in relation to public priorities, revenue sources, and other factors. Second, although the core functions were explicitly defined, there were state-specific differences in statutory responsibilities and organization of state public health agencies that, in turn, were associated with variations in expenditures on core public health functions.

Public health functions and services have been defined and classified previously by organizations including the National Academy of Sciences–Institute of Medicine (*5*), the National Association of County and City Health Officials (*6*), CDC (*7*), and some states. To further define the purposes and services of public health, in 1994 PHS convened a workgroup with representatives from multiple public-sector and professional organizations.† This work group defined six public health responsibilities and 10 essential services of public health (Table 1).

In 1988, the Institute of Medicine recommended strengthening the public health system (*5*). Other organizations have suggested that funding of community-oriented public health functions should be three times higher than the current amount (*2,8*). The PHS continues to investigate expenditures on public health: nine states are participating in a second pilot study for fiscal year 1994 that will more precisely measure expenditures associated with the essential public health services. State and local health agencies and other partners should continue to examine expenditures on public health activities and ensure that essential public health services are carried out.

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†Agency for Health Care Policy and Research, American Public Health Association, Association of Schools of Public Health, Association of State and Territorial Health Officials, Food and Drug Administration, Health Resources and Services Administration, Indian Health Service, National Academy of Sciences-Institute of Medicine, National Association of County and City Health Officials, National Association of State Alcohol and Drug Abuse Directors, National Association of State Mental Health Program Directors, Office of the Assistant Secretary for Health, Public Health Foundation, Substance Abuse and Mental Health Services Administration, and CDC.

Core Public Health Functions — Continued

TABLE 1. Public health responsibilities and essential public health services — 1994

Public Health:

- Prevents epidemics and the spread of disease
- Protects against environmental hazards
- Prevents injuries
- Promotes and encourages healthy behaviors and mental health
- Responds to disasters and assists communities in recovery
- Assures the quality and accessibility of health services

Essential Public Health Services:

- Monitor health status to identify and solve community health problems
- Diagnose and investigate health problems and health hazards in the community
- Inform, educate, and empower people about health issues
- Mobilize community partnerships and action to identify and solve health problems
- Develop policies and plans that support individual and community health efforts
- Enforce laws and regulations that protect health and ensure safety
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable
- Assure a competent public health and personal health care workforce
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services
- Research for new insights and innovative solutions to health problems

Source: Essential Public Health Services Work Group.

Notice to Readers

Update: Availability of Electronic *MMWR* on Internet

Since January 27, 1995, the *MMWR* series has been available in an electronic format on the Internet (*1*); current and past copies (since January 15, 1993) of the electronic *MMWR* series are available. To access CDC's Internet file servers, users must have Internet access and software that retrieves files by file transfer protocol (FTP) or software that will access the World Wide Web (WWW). As of May 1, changes have been made in the names of some directories used to access the electronic *MMWR* files and Adobe™ Acrobat™* Reader software (produced by Adobe, Inc.) required to view the electronic *MMWR* in Adobe™ Acrobat™ portable document format (.pdf). Following are the revised instructions.

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Users can receive *MMWR* by connecting to the following servers:

Notices to Readers — Continued

CDC FTP server. Use FTP to connect to CDC's file server ftp.cdc.gov . Supply user name **anonymous**, and give the user's Internet e-mail address in response to the prompt for the password. Select the subdirectory **/pub/publications**, then subdirectory **mmwr**. Select subdirectory **wk** for the *MMWR* (weekly), subdirectory **ss** for *CDC Surveillance Summaries*, or subdirectory **rr** for *MMWR Recommendations and Reports*. Then view the listing, and download the files of interest.

Each .pdf file represents a single issue of *MMWR* and is named according to the publication, volume, and issue number. For example, mm4301.pdf contains all pages for the *MMWR* (weekly) Volume 43, Number 1. Files with the prefix rr or ss represent *MMWR Recommendations and Reports* or *CDC Surveillance Summaries*, respectively.

CDC WWW server. Programs that browse the WWW (e.g., Mosaic) allow particularly easy navigation of the Internet. Use WWW software to connect to the *MMWR* WWW pages at either of the following addresses:

- http://www.cdc.gov/ Go to **Publications, Products, and Subscription Services**, then **Morbidity and Mortality Weekly Report (MMWR)** to find the *MMWR*, OR
- http://www.crawford.com/cdc/mmwr/mmwr.html To access the *MMWR*, follow the instructions that appear on the screen.

How to Obtain *MMWR* from the Public E-Mail List

An automatic service is available for receiving a weekly notification of the contents of the *MMWR* and instructions on how to electronically retrieve the complete *MMWR* file through e-mail. To subscribe, send an e-mail message to lists@list.cdc.gov . The body content of the e-mail should read **subscribe mmwr-toc**. The subscriber will be added automatically to the mailing list and receive a weekly table of contents and other announcements regarding the electronic *MMWR*. Subscribers will also receive instructions about additional e-mail commands, such as retrieving documents, sending messages to the system operator, canceling a subscription, or sending an e-mail change of address.

Some sites may have to process the received mail attachments with a uudecode utility to create an acceptable binary file readable by Acrobat™ . If the user's e-mail system does not have uudecode, the user should contact his/her e-mail administrator. Uudecode software is available free of charge at many FTP sites on the Internet. Questions about the list service should be sent to mmwr-questions@list.cdc.gov by e-mail.

How to Obtain Free Reader Software

Adobe™ Acrobat™ Reader software is required to view the contents of the *MMWR* electronic files. Free Adobe™ Acrobat™ Reader software is available on the Internet from CDC and Adobe, Inc.

From CDC FTP server. To download Adobe™ Acrobat™ Reader software through the Internet, use FTP to connect to CDC's file server **ftp.cdc.gov**. Supply the user name **anonymous** and your Internet e-mail address when prompted for the password. Select the subdirectory **pub**, then the subdirectory **Acrobat**. Download the appropriate file (DOS, Macintosh®, UNIX®, Windows™).

From CDC WWW server. Free software also can be downloaded by connecting to the WWW. Using WWW software, connect to the following addresses for *MMWR* documents:

Notices to Readers — Continued

- http://www.cdc.gov/ Choose **Publications, Products, and Subscription Services,** then **Morbidity and Mortality Weekly Report (MMWR),** and finally **Adobe™ Acrobat™ Reader.** Read the instructions. Then choose **Obtain a free copy of the Adobe™ Acrobat™ Reader.** Select "download to disk" from the WWW software, and download the appropriate DOS, Macintosh®, UNIX®, or Windows™ reader(s).
- http://www.crawford.com/cdc/mmwr/mmwr.html Choose **Adobe™ Acrobat™ Reader.** Read the instructions. Then select **Obtain a free copy of the Adobe™ Acrobat™ Reader.** Select "download to disk" from the WWW software, and download the appropriate DOS, Macintosh®, UNIX®, or Windows™ reader(s).

From Adobe, Inc., FTP server. Free Adobe™ Reader software is available by connecting to the anonymous FTP site **ftp.adobe.com** to download the software.

Adobe, Inc., also has a dial-in electronic bulletin board (BBS) at (206) 623-6984. Connecting to the BBS requires a modem and a terminal emulation program that supports VT-100 or ANSI emulation. Modem settings should be 8 data bits, 1 stop bit, and no parity. Adobe's BBS will support modems with speeds up to 14.4 kb. To use the BBS, the user should log in with his/her own name as the user ID, and select a password. Adobe BBS will not accept a blank as either the user ID or the password.

From Adobe, Inc., WWW server. Using WWW software, connect to http://www.adobe.com/ and follow the instructions.

Adobe Software Support

Adobe™ Acrobat™ software installation and use questions should be directed to Adobe™ Acrobat™ software support. Assistance is available Monday–Thursday 6 a.m.–5 p.m. and Friday 6 a.m.–2 p.m. (Pacific time) at the following telephone numbers: Adobe™ Acrobat™ Reader Support, (900) 555-2362; Adobe™ Acrobat™ Technical Support, (408) 986-6580; Adobe™ Technical Support BBS, (206) 623-6984.

Users should *not* call CDC's *MMWR* office for software support.

Reference

1. CDC. Availability of electronic *MMWR* on Internet. MMWR 1995;44:48–50.

Notice to Readers

Conference on Prevention of Spina Bifida and Anencephaly

CDC is sponsoring a conference, "Time for Action: Prevention of Spina Bifida and Anencephaly," June 19–20, 1995, in Alexandria, Virginia. The purpose of the conference is to inform participants of activities under way and to solicit input into future activities leading to full implementation of the 1992 Public Health Service recommendation that all women capable of becoming pregnant consume 0.4 mg of folic acid daily to reduce the risk for a pregnancy affected by a neural tube defect. Additional information is available from CDC's Division of Birth Defects and Developmental Disabilities, National Center for Environmental Health, telephone (404) 488-7160.

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format and on a paid subscription basis for paper copy. To receive an electronic copy on Friday of each week, send an e-mail message to *lists@list.cdc.gov*. The body content should read *subscribe mmwr-toc*. Electronic copy also is available from CDC's World-Wide Web server at *http://www.cdc.gov/* or from CDC's file transfer protocol server at *ftp.cdc.gov*. To subscribe for paper copy, contact Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238.

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